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Good Harvest in Corn Should Help Manage Soybean SDS

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Good Harvest in Corn Should Help Manage Soybean SDS

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This year is one of the worst soybean sudden death syndrome (SDS) epidemics since the disease was found in Iowa in 1994. Preliminary research data suggest that corn has much to do with SDS pathogen and there are things we can do about the disease as we begin harvest. Management of SDS should start when we harvest corn fields.

We have been puzzled by the fact that SDS is more prevalent in the Corn Belt when the disease was first reported in Arkansas. This summer many people in Iowa reported that SDS occurred in soybean fields where little or no SDS had been seen previously. These fields have been in a corn and soybean rotation for years. And there have been many reports of severe outbreaks of SDS in fields which had been in continuous corn for years. We speculated that rotation with corn may have something to do with it; specifically, corn may harbor the SDS pathogen in the absence of soybeans.

With funding from the Iowa Soybean Association, we conducted studies for two years, both in greenhouse and field plots to examine the survival of SDS fungus in corn. We wanted to see if corn residue harbored SDS pathogen in the absence of soybeans. We compared the survival of SDS fungus in two crop residues (corn or soybean) which included different parts of a plant (root, stalk, kernels). We consistently found the highest SDS fungus population in the treatment with corn kernels at a density of average harvest loss.

We repeated the experiments in both greenhouse and fields, and the results are consistent over the two years. Figure 1 shows the frequency of the SDS fungus isolated from field plots that had a variety of crop residues plus the SDS fungus; Figure 2 shows the frequency of the fungus isolated from similar treatments in the greenhouse.

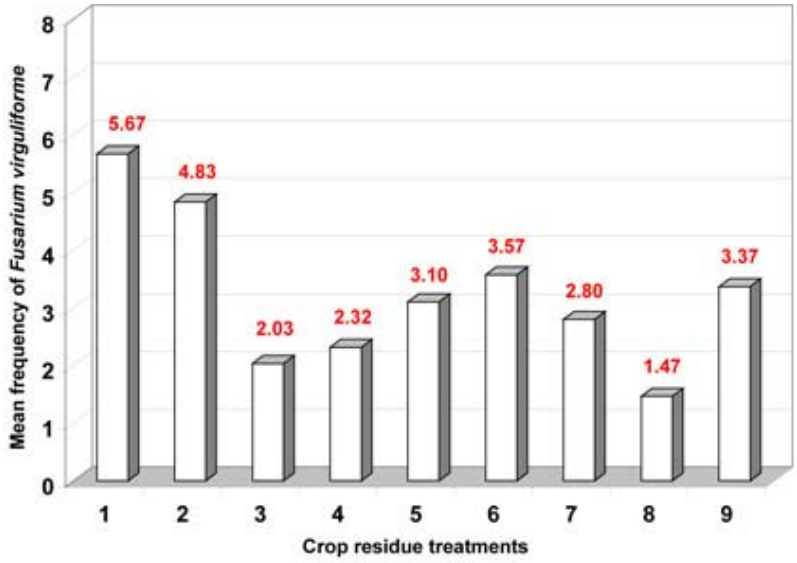

Figure 1. Frequency of SDS fungus (*Fusarium virguliforme*) isolated from field plots that had a mixture of crop residues and the SDS fungus

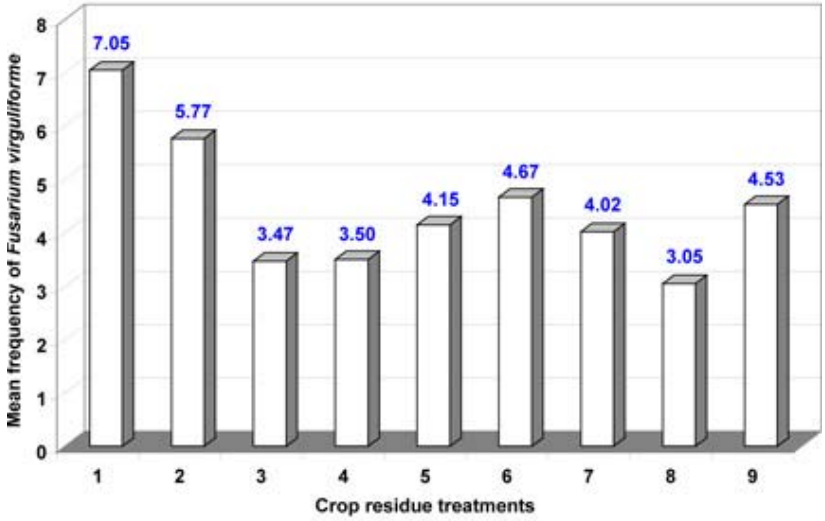

Figure 2. Frequency of SDS fungus (*Fusarium virguliforme*) isolated from greenhouse clay pots that had a mixture of crop residues and SDS fungus

Crop Residue Treatments

1: Corn kernels + SDS fungus *Fusarium virguliforme* (FV)
2: Corn roots + FV
3: Corn stalk (stem, leaves, husk) + FV
4: No residue + FV
5: Soybean seeds + FV
6: Soybean residue (stem, leaves, pods) + FV
7: Soybean roots + FV
8: Corn stalk on soil surface + FV
9: Corn kernels & stalk on soil surface = FV

Soil samples also were collected from one field each of the following counties - Boone, Blackhawk and Delaware. These fields had SDS in previous growing seasons and were in corn-soybean rotation. Cropping history and yield data were collected from these farms to better understand survival of SDS fungus in soil and on residues. Results from these farms are on par with the results shown in Figures 1 and 2.

Our findings are consistent with the following observations:

1) severe SDS occurs in corn/soybean rotation fields although little or no previous SDS was observed;
2) severe outbreaks of SDS occurred after a few years of continued corn production; and
3) severe SDS was found in seed-corn fields which often have a lot of unharvested kernels due to quality control.

Although we are yet to experiment which tillage measures better reduce SDS pathogen in corn/soybean rotation, our results suggest that a nice and clean harvest of corn should help reduce the risk of SDS, while a high amount of harvest loss increases SDS risk.

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